Functional Requirements:

1. User Registration:

- Users should be able to register with the system by providing necessary information such as username, password, email, first name, and last name.

2. User Login:

- Registered users should be able to log in to the system using their username and password.

3. User Profile Management:

- Users should be able to view and update their profile details.
- Profile details include username, email, first name, and last name.

4. Student Functions:

- Students should be able to view available courses.
- Students should be able to enroll in courses.
- Students should be able to view their enrolled courses.
- Students should be able to view course materials.

5. Teacher Functions:

- Teachers should be able to create courses by providing a title and description.
- Teachers should be able to add materials to their courses.

6. Administrator Functions:

- Administrators should be able to manage users, including adding, updating, and deleting user accounts.
- Administrators should be able to manage courses, including adding, updating, and deleting course information.

7. Course Management:

- Courses should have an instructor (teacher) assigned to them.

- Courses should have a list of students enrolled in them.
- Courses should have the ability to start and end.

8. Material Management:

- Materials should have a type associated with them (e.g., text, video, presentation).
- Materials should be viewable by users enrolled in the corresponding course.

Non-Functional Requirements:

1. Security:

- User passwords should be securely stored using encryption techniques.
- Access to sensitive functions (e.g., user management, course management) should be restricted to authorized users.

2. Performance:

- The system should be able to handle concurrent user requests efficiently.
- Response times for user interactions (e.g., login, course enrollment) should be fast.

3. Scalability:

- The system should be designed to scale with an increasing number of users and courses.
- It should be able to handle a large volume of data without significant degradation in performance.

4. Reliability:

- The system should be highly available and reliable, with minimal downtime.
- Data integrity should be maintained, ensuring that user data and course information are accurate and consistent.

5. Usability:

- The user interface should be intuitive and easy to use, catering to users of varying technical expertise.
- Navigation within the system should be straightforward, allowing users to access desired features quickly.

6. Accessibility:

- The system should be accessible to users with disabilities, complying with accessibility standards and guidelines.

7. Data Backup and Recovery:

- Regular backups of the database should be performed to prevent data loss.
- Procedures for data recovery in case of system failure or data corruption should be in place.

8. Audit Trail:

- The system should maintain an audit trail of user activities, including logins, course enrollments, and material access.
- Audit logs should be accessible to administrators for monitoring and troubleshooting purposes.